

Abstract of the Disclosure

Fuel cell systems that include at least one fuel cell stack adapted to receive a fuel stream containing hydrogen gas or other proton source, and an oxidant stream containing oxygen gas. The systems include an oxidant supply system adapted to deliver an enriched, or concentrated, oxidant stream to the fuel cell stack. In some embodiments, the oxidant supply system is adapted to receive an air stream and produce an oxygen-enriched stream therefrom. In some embodiments, the fuel cell system includes a water-recovery system adapted to recover water produced in the fuel cell stack, such as may be recovered from the cathode exhaust stream from the fuel cell stack. In some embodiments, the recovered water is utilized as at least a portion of a feed stream for the fuel cell system, such as for a reformer or electrolyzer that produces hydrogen used as fuel for the fuel cell stack.